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MARCH-APRIL 2012

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OUR WILDLIFE ART LEGACY

MOOSE STEP OUT OF THE SHADOWS

SAVING THE NORTH FORK OF THE FLATHEAD

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Montana Outdoors

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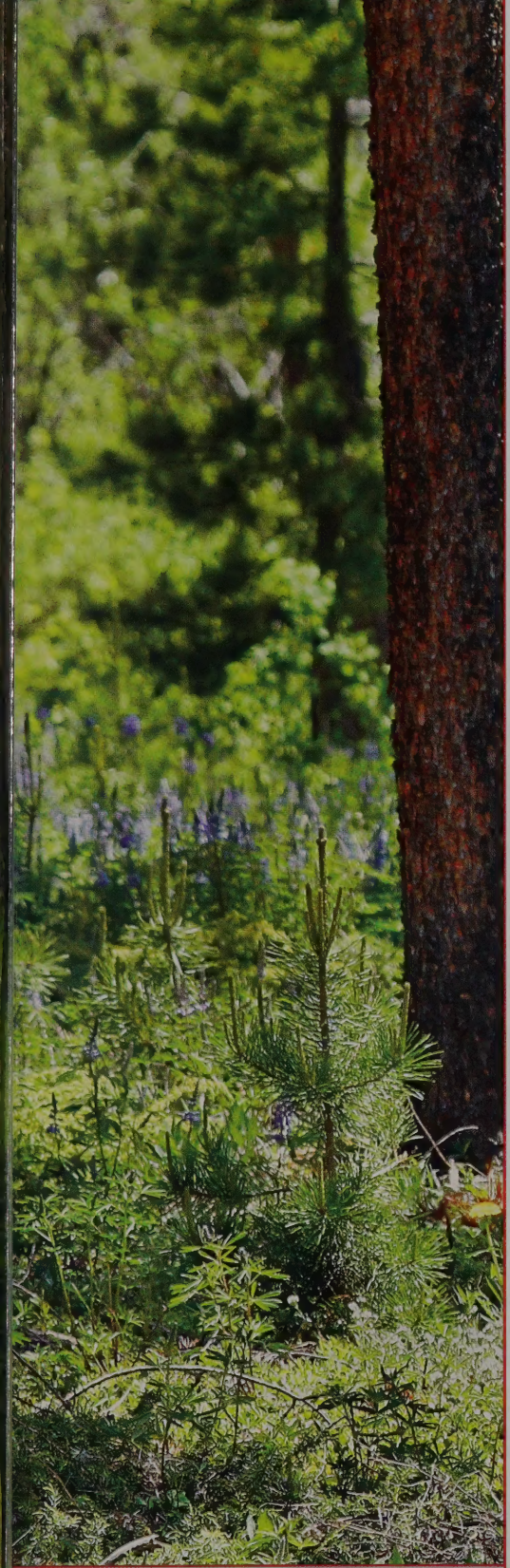


NEW GROWTH Find out on page 34 how a new FWP study could shine a light on moose mortality and population trends. Photo by Vic Schendel.

FRONT COVER See page 28 to learn how great blue herons and other birds woo their mates. Photo by W. Steve Sherman.

Nice work, FWP

I just read about Montana Wild ("Plugging People In To the Outdoors," November-December) and was very much impressed. Kudos to FWP for creating such a facility. It cuts across several disciplines and is a wonderful resource for the people of Montana. Most states are suffering from lack of funds, but Montana is putting its financial resources to good use.

I am a multigenerational Montana native who grew up in Great Falls and later lived in the Flathead. I now live in southwestern Minnesota and will continue to subscribe to the incomparable *Montana Outdoors*.

Harry Johnson
Redwood Falls, MN

Fond memories

I recently finished reading Craig Jourdonnais's essay "Return to Camp Musselshell" (September-October). Sometimes we parents, fathers especially, don't realize until years later what it means to our children and ourselves when we take them on adventures in the outdoors. It's always gratifying to me when one of my adult children brings up a past trip in a conversation. Jourdonnais made some insightful comments about how a father feels about his children. And near the end of the article, when he said that antelope hunting was just an excuse to build memories, he really brought together all the reasons why any of us hunts.

Gerald Eswein
Wisconsin Rapids, WI

How does that work?

I'm puzzled by the sidebar in the antlers article ("Coveting the Crown," September-October) in which Valerius Geist says that by not participating in the rut, a bull's or buck's energy can go into growing a bigger rack. I thought the rack was hardened and the velvet shed well before the rut started. Down here in Indiana, the rut gets going in November. I'm not looking to spar with a 6x6 like Geist, just looking for some clarification.

Jim Avelis
Terre Haute, IN

Tom Dickson replies: The energy is stored over winter for the following year's antler production. Bulls and bucks that spar extensively during the rut enter winter depleted of fat reserves and barely scrape by during the cold months. They are just starting to put on fat when summer starts. But the "shirker" bucks and bulls that lounged around during the rut enter winter with plenty of fat and are fit and healthy to produce large antlers the following summer.

Plugging People In To the Outdoors

Montana Wild—FWP's new education and conservation center—is helping kids, adults, and families connect with the natural world.

Collateral damage

I will not be able to renew my subscription to *Montana Outdoors*. I spent the money on Montana's increased nonresident license fees. Great magazine, but I would rather hunt than look at great pictures.

C. Mathewson
Olympia, WA

Hunting here: priceless

I have to ask the hunter from Washington who wrote the letter to the editor (November-December) complaining about Montana's increased nonresident hunting license fees: Why did you and your party come to Montana to hunt every year? Was it because the hunting in your home state of Washington was so much better, or perhaps easier? I doubt it. I am sorry that you feel your hunting experiences in Montana are not worth the extra expense, but I will not miss you. We Montanans cherish our treasures and consider hunting here priceless.

John Virgin
Great Falls

Brown black bears

Page 5 of the photo issue (January-February) shows a photo identified as a black bear sow and cub. They look like grizzlies to me.

Dave Anderson
Bruceville, IN

Other readers wrote or called with the same question. Here's the answer we received from Kevin Frey, FWP bear biologist in Bozeman: "I can understand the confusion, but those definitely are black bears. Clues include the longer ears, face without a dished profile, and narrower muzzle and snout typical of black bears. For me, the best clue in this picture is the ears. Grizzly ears are almost circular, with no oval elongation." Want to learn to identify bears like an expert? Take the FWP bear identification training course and test: fwp.mt.gov/education/hunter/bearID/. This test is required for all bear hunters, but it's fun for nonhunters too.

Black bears, brown fur

Photoshopped buck?

Every year I look forward to receiving your annual photo issue. So you can understand my disappointment when I turned to page 28 of the 2012 photo issue showing a "Trophy mule deer buck." While this is a fairly good job of photoshopping antlers on a deer, I am surprised it was not caught by your staff before making it into the magazine. The most obvious reason to doubt this photo is that if it were real, it would be a world-record class mule deer, which should have at least raised a red flag.

Justin Dalby
Livingston

Tom Dickson replies: Several readers inquired about that monster buck. It does sport a world-class rack, but the image was not doctored. It was taken by a highly skilled and reputable photographer, Tony Bynum, who consistently finds massive mule deer bucks in northwestern Montana by spending many days in the field. Bynum told us this particular buck lives on public land closed to public hunting, which is why it has been able to live long enough to grow such enormous antlers. He's keeping the location secret because of concern the deer would be susceptible to poaching. As verification, he sent us a shot of him photographing the buck. See his other trophy buck shots at tonybynum.com.

Braised Portuguese Venison Shanks

Serves 8
Prep Time: **45 minutes**
Cook Time: **3 to 5 hours**

HOLLY A. HEYSER/HEYSERPHOTO.COM

TRY THIS SIMPLE RECIPE and you'll never throw away a venison shank again. What's more, I think you'll end up agreeing with me that shanks are among the best-tasting cuts of your deer and elk. Sound crazy?

I thought so at first. Shanks were the least-favorite part of my big game harvest—long, dense hunks of meat sheathed in tissue tough enough to dull a knife blade. After cutting the meat off the bone, I'd then have to fillet a half-dozen tissue-encased meat tubes. Sometimes, with a whitetail doe, I'd end up with no more than a cup of meat for the sausage pile. Hardly worth the effort.

Then I learned about braising, how cooking tough cuts for a long time with moist, low heat will break down the tough tissue and turn it into velvety gelatin. That luscious goo melds with what magically, after several hours, has become moist, fork-tender meat infused with spices and braising liquid.

Nowadays I find myself wishing for eight-legged deer. Twice as many shanks.

This may be the best shank recipe out there. I found it on Hank Shaw's award-winning food blog, "Hunter, Angler, Gardener, Cook" (which I recommend to anyone interested in learning how to make delicious game dishes). It's a twist on a recipe in David Leite's *The New Portuguese Table*. The version here is Shaw's, though I've simplified it to use only spices and herbs found in any Montana grocery story. It's delicious.

—Tom Dickson

INGREDIENTS

4 deer or 2 elk shanks*
Salt
1 t. black peppercorns or ½ t. black pepper
½ t. powdered allspice
1 t. juniper berries (or 1 t. gin)
8 whole cloves
1 cinnamon stick
1 t. chile powder
2 bay leaves
1 t. olive oil
6 oz. thick-cut bacon, cut into chunks
2 yellow onions, minced
8 garlic cloves, peeled and roughly chopped
1 bottle red wine
2 t. molasses
2 C. beef stock or venison stock

*If the shanks are too long for the pot, cut to fit with a clean-bladed hacksaw. Be sure to remove all bone dust from the meat. This recipe also works well for a neck roast.

PREPARATION

Salt shanks and set aside.

In a large pot with a lid (a Dutch oven or French oven is best), put spices and herbs in with the wine and molasses. Turn the heat to medium-low.

Preheat the oven to 300 degrees.

Pour olive oil into another large pan set over medium heat. Fry the bacon slowly, turning all sides to get crispy. As each piece crispifies, toss it into the pot containing the wine. Do not let the wine go past a gentle simmer.

Add the shanks to the leftover bacon grease and brown on all sides except the one with the bone; this helps the shank stay together after long cooking. Take your time with this step, and do it over medium heat. It could take 20 minutes.

Move the shanks to the wine pot, bone side sticking up.

Put the onions in the bacon grease pan and turn the heat up to high. Toss to combine. The onions will deglaze the pan. After about 5 minutes, add the garlic and toss to combine. Continue cooking until you hear the sound change: That's the onions losing enough moisture to begin browning. Cook another minute or two.

Pour in the stock and mix it well with the onions. Bring to a furious boil and make sure you scrape everything off the bottom of the pan.

Add to the wine pot, mixing in with all the other ingredients. Make sure the shanks are still bone side up.

Cover and cook in the oven for 3 to 5 hours (less time for a younger deer, more for an older one).

When the meat is almost falling off the bone, remove it gently and tent with foil.

Fish out the bay leaves, cinnamon stick, and as many cloves, peppercorns, and juniper berries (if used) as you can. It's okay if you don't get them all.

Puree the sauce in a blender or pass it through a food mill set on a medium setting. It should be thick. Pour over the shanks and serve at once with mashed root vegetables and something green.

Understanding the Bonus Point System

It doesn't seem fair. You've been putting in for a moose, mountain goat, or bighorn sheep license, or a special deer or elk permit, for 10, 20, even 30 years and still haven't drawn one. Then you hear that your neighbor's son was drawn his second year of trying.

Hard as it might be to believe, FWP's system of allocating permits and licenses is the fairest one around.

For years Montana had what's known as a true preference system. Licenses were awarded based on seniority. Every year that a hunter put in for a license and wasn't drawn, he or she would move up the preference "ladder." FWP drew license applications starting from the top of the ladder, ensuring that those who had applied the most years would be drawn before others. Seems equitable, right?

To some extent it was. But it had flaws.

For rare tags like some bighorn sheep licenses, where 1,000 or more hunters apply for each one, even the true preference system didn't guarantee a license within a hunter's lifetime.

Of even greater concern was that the true preference system was hard on young and new hunters. For many licenses, they had no chance of getting drawn for years. Think about it: If you were 20 years old and wanted to hunt a moose but knew you'd have absolutely no chance until you were 55 or so, would you keep applying?

In the early 2000s FWP came up with a system that gives those with the most preference points the best odds of being drawn (though not a guarantee), while allowing those putting in for the first time or with a just a few preference points a chance (though a slim one) of being drawn. Here's how it works:

Each year you may buy one bonus point for each license or permit you apply for. The cost per permit or license is $2 for residents and $20 for nonresidents. Points accumulate each year you are unsuccessful in the drawing. The more points you accumulate, the more chances are entered for you into the drawing, like tickets into a hat.

Keep in mind that most other hunters also are accumulating points, so they have "extra tickets" added to each drawing too. As a result, your odds for the most coveted licenses and permits are still not great even though they improve each year. Montana has relatively small numbers of some very popular big game species. To protect those populations from overharvest, FWP issues relatively few permits or licenses. Consequently, large numbers of hunters often end up competing for a very small number of tags. Demand far exceeds supply.

Hard as it might be to believe, FWP's system of allocating permits and licenses is the fairest one around.

Occasionally a first-timer beats the odds and wins. And it's true that hunters who have put in for 20 or more years for certain permits or licenses still haven't drawn one. But it's far more common—due to the laws of probability—that hunters with the most bonus points win the license and permit lotteries each year.

The 2011 legislature moved the system closer to the old true preference system by requiring that FWP use what's known as a "squaring" of the bonus point system. Starting this year, everyone with bonus points will have their points squared. For instance, a person with 4 points will actually have 16 points (tickets in the hat). If that person isn't drawn the next year, he or she will then have 5 points squared, or 25 points. And so on. That will increase the odds for hunters who have been applying the longest. Young and new hunters will still have a chance, though less than what they had previously.

How fair you think that is probably depends on whether you are a hunter just starting out or one who has been applying for licenses or permits unsuccessfully for many years.

In any case, good luck and keep trying.

—**Joe Maurier**, Montana FWP Director

TONY BYNUM

Last year 13,140 hunters applied for Montana's 257 mountain goat licenses. As with moose, bighorn sheep, trophy mule deer and elk, and other coveted tags, demand far exceeds supply, requiring a lottery for allocating licenses and permits fairly.

THOMAS LEE

JENNIFER RAMSEY

FWP VETERINARIAN * FWP PATHOLOGY LABORATORY, BOZEMAN

THIS IS THE HEAD *of a bighorn sheep ram we got last winter from Cinnabar Basin north of Gardiner. Karen Loveless, the FWP biologist there, had seen several sheep in the area that were coughing, and we wanted to test to see if they had pneumonia.*

I'll saw this head open so I can examine the sinus cavities and inner ears for signs of infection. Then I'll send a tissue sample to a lab in Washington State so they can figure out what particular bacteria might be involved. They usually let us know within a few weeks.

I have a pretty high tolerance for disgusting things. We do a lot of necropsies of grizzlies and wolves, and some of them have been dead for a long time. I'm fine with it and find it really fascinating, but sometimes we'll get complaints from [the FWP office] next door that we're stinking up their building. So for me, working on a sheep head is really not bad at all.

Whitefish photographer **DEE LINNELL BLANK** and her partner were backpacking in Glacier National Park last August when they came upon this snowfield near Jackson Glacier. "The rhythm and patterns repeating in the bedrock and collapsing snowfield were a great example of the dynamic landscape around the glacier," she says. "There were icefalls, exposed geology, and waterfalls gushing everywhere. The blue you see is the freshly broken surfaces of old, compacted snow. When the crystals and air pockets compress, they filter out the longer red wavelengths of light and allow more of the shorter blue wavelengths to be seen." ■

320

Current retail price, in dollars, for 1 pound of caviar harvested from Yellowstone River paddlefish snagged below Intake Dam, north of Glendive

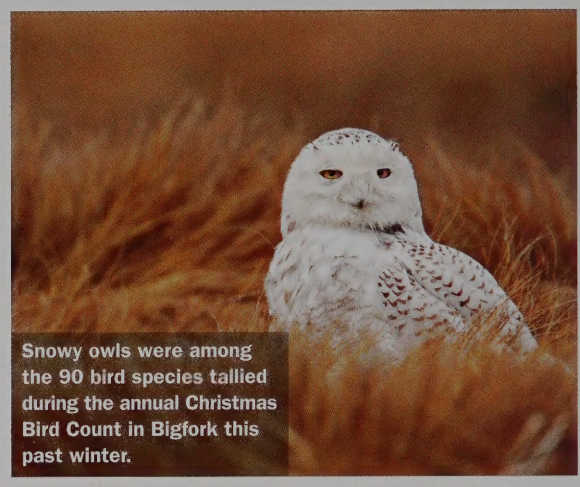
STAY OFF THIN ICE

Many lakes and ponds are still covered in ice this time of year, but they are melting fast. FWP officials warn anglers, skaters, and others to stay away from gray or dark ice, which is weaker and softer than harder blue or white ice. Other tips:

- Ice thins more quickly along shorelines.
- Ice thickness varies widely. Just because one area has thick ice doesn't mean all ice is safe.
- Moving water—rivers, streams, and springs—weakens ice by wearing it away from underneath. Avoid ice on rivers and streams, or where a river or stream enters a lake, pond, or reservoir.

WILDLIFE WATCHING

Bigfork birders set state CBC record



Snowy owls were among the 90 bird species tallied during the annual Christmas Bird Count in Bigfork this past winter.

Bird watchers in the Bigfork area saw more bird species during the 2011 Audubon Christmas Bird Count (CBC) than ever recorded in the survey's 103-year history in Montana. Among the 90 species tallied by Bigfork birders were snowy owls, red-necked grebes, and a ruddy duck.

Dan Casey of the American Bird Conservancy in Kalispell says the Bigfork area attracts diverse birds because it has a wide range of habitats, including Flathead Lake, the Swan River, forests, mountains, and agricultural land. "It's always a winter birding hotspot," says Casey, who has led the Bigfork CBC since 1984.

The CBC is the world's longest-running survey conducted by citizen scientists. Counts are conducted between mid-December and early January. During a single calendar day, volunteers follow specified routes through designated 15-mile-diameter circular areas and record every bird they see.

Steve Hoffman, executive director of Montana Audubon, says 32 counts were conducted throughout the state by students, scientists, and bird watchers. The most surprising sightings included a barn owl, several ruby-crowned kinglets, two turkey vultures, and, a day before the official count, a hummingbird (likely an Anna's) near Flathead Lake.

Hoffman says CBCs show upward and downward bird population trends over the long haul. Scientists examine the trends to see if they can determine contributing factors, such as habitat alterations, climate change, or the banning or increased use of certain chemicals.

Casey notes that one marked decline documented by the Bigfork CBC has been in wild turkeys, which dropped from a high of 761 in 1985 to just 180 in 2011. He attributes the decrease to fewer livestock operations, where in winter ranchers put out feed pellets for their cattle, horses, or llamas.

CBC birders set a local record in Ennis with 73 species, topping the previous high of 61. The CBC in Bozeman counted 59 species, including three new ones: snow goose, Ross' goose, and hermit thrush. Birders in West Yellowstone recorded 35 species, including a first-ever CBC sighting in that area of a robin, ordinarily on winter vacation hundreds of miles south during the survey. ■

HUNTING RESULTS

Big game harvest results now on-line

What part of Montana has the most large-antlered deer? Where do hunters have the best success harvesting bighorn sheep? How many elk were shot in your hunting district last year—and what proportion were bulls?

Curious hunters and others interested in the results of Montana hunting seasons can now find the information on-line. Type in the species, year, and hunting district that interest you. A table pops up showing success rates, days hunted per hunter, number of 6x6 bulls harvested, and other data. The information goes back to 2004.

Justin Gude, head of FWP wildlife research, says the department has collected harvest information for decades. Biologists use the data to determine the effects of hunting regulations each year and decide how regulations should be adjusted.

Unfortunately for hunters, "the format our biologists use is extremely detailed, with huge, unwieldy tables of data," Gude says. Previously, hunters would have to pore through lengthy spreadsheets trying to find information. "We decided a few years ago that the information needed to be more readily available to the people—hunters—who are paying us to compile it," Gude says. He adds that students, journalists, FWP officials, and legislative staff also use the reports, found at fwp.mt.gov. ■

SURVEY FINDINGS

Bigger bucks not necessarily better, say most mule deer hunters in new FWP survey

In some areas of Montana, FWP might be able to produce more mule deer bucks with larger antlers. But that would require limiting permits, which would mean hunters in those areas could hunt only every three to ten years.

Would hunters be willing to make that trade-off?

That was among the questions asked in a survey of Montana mule deer hunters that FWP conducted in 2011. "Among other things, we wanted to find out to what extent hunters would be willing to trade more chances to see larger bucks in exchange for giving up the opportunity to hunt every year," says Mike Lewis, supervisor of the FWP Human Dimensions Unit, who managed the survey.

Among the results:

- Roughly two-thirds of resident hunters surveyed said they would not trade the opportunity to hunt mule deer bucks every year (with a lower probability of seeing big bucks) for increased odds of seeing larger bucks (but only being able to hunt every several years). "This tells us that, when given the choice, most hunters would rather hunt every year, even if that means a lower probability of harvesting a big buck," says Justin Gude, head of FWP wildlife research.

Nice buck, but worth waiting up to ten years for a crack at it?

About one-third of hunters said they would be willing to wait several years to hunt places with more big bucks.

"Right now, approximately 20 to 25 percent of Montana's hunting districts are limited entry. So it appears that the opportunity for hunting in those areas corresponds fairly well to the demand that's out there," Gude says.

- 65 percent of respondents support hunting mule deer bucks during the rut, with 14 percent opposing and 21 percent having no opinion.
- 77 percent said they were satisfied with existing mule deer hunting regulations in Montana, though there were regional differences. For instance, satisfaction with mule deer regulations was only 59 percent among hunters from west-central Montana (FWP's Region 2).
- Only 2 percent said the regulations are "very difficult to understand." "That low percentage was a pleasant surprise," says Quentin Kujala, head of FWP wildlife programs. "We know the regulations are complex. But this tells us they are still comprehensible to the vast majority of hunters."
- 50 percent said opportunities to hunt large-antlered mule deer bucks in Montana are fair, good, or excellent. "Even though we hear from some hunters that Montana has poor trophy opportunities, half of hunters responding to the survey said opportunities are pretty decent," says Gude.
- Of ten possible reasons for hunting mule deer, 91 percent said the most important was "to enjoy nature and the outdoors," followed by being with friends (77 percent) and spending time with family (71 percent). Less important reasons were to achieve personal satisfaction (59 percent) and to harvest a trophy buck (47 percent).

"There is always room for improvement, but I think the survey shows that our current mule deer management is pretty closely aligned with most hunters' desires and expectations," says Gude.

Read a synopsis of the survey on-line at http://fwp.mt.gov/fwpDoc.html?id=53311. ■

MONTANA'S NEW MARCH MADNESS

Mid-March is famous for kicking off the NCAA basketball tournament. Now add another sporting tradition: applying for FWP deer and elk permits.

Starting this year, FWP has moved the deadline for deer and elk permits ahead from June 1 to March 15.

For years the application deadline was June 1. In fall 2011, the FWP Commission moved the date up so the permit drawing could be conducted earlier (in mid-April rather than late July as in years past).

"The idea is to give successful permit applicants about three extra months to plan their fall hunts," says Hank Worsech, chief of the FWP License Bureau.

Other application deadlines remain the same: June 1 for antlerless deer (Deer B), antlerless elk (Elk B), and all antelope licenses, as well as May 1 for moose, bighorn sheep, bison, and mountain goats.

Questions? Call FWP at (406) 444-2950.

CLOCKWISE FROM TOP LEFT: ILLUSTRATION BY MIKE MORAN; SNOWY OWL: PAUL TESSIER; ISTOCKPHOTO; BUCK: RODNEY SCHLECHT; ATV ACCIDENT: INVISIONFREE.COM

Visions of what once was and may be again

Montana's wildlife art legacy captures the state's untamed heritage and inspires contemporary audiences to recover what has been lost. **By Todd Wilkinson**

Think of picture postcards you've mailed to friends from travels to wild, faraway places. What message were you hoping to communicate?

In 1832 renowned American West artist George Catlin created what are likely the first portable paintings of what later became Montana. The artwork depicted wildlife and landscapes Catlin observed beyond Fort Union near the confluence of the Yellowstone and Missouri Rivers. These oil "postcards" the artist carried home to Pennsylvania expressed much more than "Having a great time" (though by all accounts Catlin immensely enjoyed his western travels). They documented a landscape and its inhabitants that Americans to the east had only read about and could hardly imagine.

Catlin saw the essence of what Thomas Jefferson had described as the "undiscovered country." In eastern Montana he recorded prairie species ranging from elk and bighorn sheep to grizzly bears and wolves. He observed Native Americans engaged in the hunt. His portrayals, now housed in America's finest museums, were dispatches sent to citizens of a young country eager to know what lay beyond the western horizon.

Portraits of Grizzly Bear and Mouse, 1846–48, by George Catlin
OIL ON CANVAS. SMITHSONIAN AMERICAN ART MUSEUM

Swift Fox, 1844, by John James Audubon
WATERCOLOR, AMERICAN MUSEUM OF NATURAL HISTORY

Catlin wasn't the first wildlife artist to set foot in today's Montana. Pictographs and petroglyphs left behind in caves and alcoves, such as those still visible at Pictograph Caves State Park, speak to the reverence that aboriginal artists held for the region's fauna going back 10,000 years, maybe longer.

Dan Flores, professor of western history at the University of Montana, makes a strong case for why the state's art legacy matters. The author of *Visions of the Big Sky: Painting and Photographing the Northern Rocky Mountain West*, Flores says art functions as a portal for peering into the past, providing us with a way to make sense of who we are as a civilization and people. Art also acts as a gauge for taking stock of what we have lost—and what we might work to recover. Flores views those early artistic interpretations as a challenge laid at our feet, imploring us to be stewards of the wildlife, land, and other subject matter.

I had similar thoughts years ago during a canoe trip along the Missouri River's White Cliffs Area while clutching a hardbound book containing the historic hand-colored etchings of Karl Bodmer, the mid-19th-century Swiss painter of the American West. I was in the company of George Horse Capture and Herman J. Viola, who had invited me along that day to witness the connection between art and history. Horse Capture is a native-born Montanan and distinguished elder of the Gros Ventre tribe whose ancestors may have made contact with Catlin, Bodmer, and, before them, Lewis and Clark. His great-grandfather had been an acquaintance of Charles M. Russell's and once posed for a black-and-white photograph taken by the famous photographer of American Indians, Edward S. Curtis.

Herds of Bisons and Elks on the Upper Missouri, 1840-1843, by Karl Bodmer

HAND-COLORED AQUATINT. RARE BOOKS DIVISION, THE NEW YORK PUBLIC LIBRARY, ASTOR, LENOX AND TILDEN FOUNDATIONS

A professional anthropologist and an art lover, Horse Capture was the first curator of the Plains Indian Museum at the Buffalo Bill Historical Center in Cody, Wyoming. He also helped establish the National Museum of the American Indian on the National Mall in Washington. Viola, a scholar of the American West, is curator emeritus at the Smithsonian Museum of Natural History.

Todd Wilkinson, of Bozeman, is the editor of the on-line magazine Wildlife Art Journal *and a reporter for the* Christian Science Monitor *and other publications.*

At one point in the journey, we climbed to a flat knoll peppered with ancient teepee rings above the river. Horse Capture and Viola opened the Bodmer book to an 1833 etching of a massive herd of bison moving down from the bluffs and crossing the river. They motioned toward the same spot on the Missouri as depicted in Bodmer's image, still pastoral and beautiful, yet quiet and lacking the iconic buffalo. Horse Capture's voice trembled as he spoke of his ancestral ties to the scene. The painting had transported him into a temporal space once known by his own kin.

While Montana's story is eloquently written in words, the spirit of the region is reflected in oil, ink, and watercolor. Mid-19th-century artists such as Catlin, Bodmer, and John James Audubon each made a journey up the Missouri River in large part to document what, a few decades earlier, Lewis and Clark had seen but could describe only in writing. The painters were products of the Romantic Era, an artistic movement in which artists aimed to capture the grandeur of untamed nature and evoke emotions such as awe that the natural world inspired.

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A Rocky Mountain Sheep, Ovis, Montana, 1879, by Albert Bierstadt
OIL ON PAPER MOUNTED ON BOARD. PRIVATE COLLECTION, IMAGE FROM WIKIPEDIA COMMONS

"In their works," writes Flores in *Visions of the Big Sky*, "this country was most of all a great Edenic wilderness of romantic scenery and animals."

More than mere decorative objects, Viola says, the paintings possessed the power to shape public attitudes. "Without art created on the doorstep of Montana, national parks might not exist as they do today," he says. Viola explains that during Catlin's trips across the high plains, the artist conceived the notion that wildlife and the Native American way of life needed to be protected in a special preserve. It was the origin of the national park concept. A few decades later, in 1871, Thomas Moran entered Yellowstone with photographer William Henry Jackson and recorded images of geysers, travertine terraces at Mammoth Hot Springs, and waterfalls in the Grand Canyon of the Yellowstone. The paintings and photographs inspired Congress to set aside that wondrous terrain as the world's first national park.

While encouraging some Americans to protect parts of the West as national sanctuaries, paintings depicting the region as an unspoiled Eden may also have hastened the mass removal of its wildlife. Fur companies had once boasted there were enough beaver in the Upper Missouri to keep hundreds of trappers dutifully employed for a century. Similar unfounded pronouncements about the number of bison—seemingly substantiated by paintings of endless herds flowing across the Great Plains—proved catastrophically false. In 1863 William Jacob Hays famously portrayed the massive bison herds on canvas with *A Herd of Bison Crossing the Missouri River*. Within a decade such sights existed only in memories and on canvas. "Even if artists didn't intend to be, they

Home of the Blackfeet, 1938, by Maynard Dixon

OIL ON MASONITE. NATIONAL COWBOY AND WESTERN HERITAGE MUSEUM, OKLAHOMA CITY, OKLAHOMA, 1998.072.03

were chroniclers of what once was," says Anne Morand, former curator at the C.M. Russell Museum in Great Falls and today director of the National Cowboy and Western Heritage Museum in Oklahoma City. During her tenure at the C.M. Russell Museum, Morand led the research work for a major exhibition on bison. She pored over photographs of hide yards and bone piles as tall as snowbanks. "When those photographs were taken, they were boastful expressions of harvest, and were not viewed with the horror we have today," Morand says. "Wildlife was gone, but they hadn't yet processed the impact of what their generation had done."

At the turn of the 20th century, observers worried that America's frontier era, which so defined the nation's character, was over. Vast regions of cheap, easily obtainable land had been claimed, and the expansive wildlands were no more. Some artists responded with nostalgic renderings of cowboy life and wildlife scenes from days gone by. Others, like Maynard Dixon, sought to depict remnants of traditional Indian culture such as what he found while visiting Montana's Blackfeet Reservation. His 1938 *Home of the Blackfeet* seeks not to recapture olden days of abundance. The plains and mountains are as devoid of wildlife as paintings a century before were filled with it.

Artistic depictions continue to shape our relationships with the natural world. One of the most popular examples is wildlife art. For decades conservationists have used paintings to raise funds—from the federal Duck Stamp that generates millions of dollars for wetland habitat acquisition, to prints auctioned at fund-raising banquets held by Pheasants Forever, the Mule Deer Foundation, Ducks Unlimited, and other conservation groups.

Art makes conservation tangible, says

Mule Deer in the Bad Lands, Dawson County, Montana, 1914, by Carl Rungius
OIL ON CANVAS. BUFFALO BILL HISTORICAL CENTER, CODY, WYOMING, 16.93.2, GIFT OF JACKSON HOLE PRESERVE, INC.

Lauren Hummel, who oversees the Rocky Mountain Elk Foundation's (RMEF) national art program from her office in Missoula. The RMEF has used the sale of original wildlife paintings and lithographs to raise millions of dollars to purchase and restore elk habitat. The foundation's featured artist in 2012 is Montana's Larry Zabel, whose work, *Satellite Bull*, portrays Treasure State wapiti. "People see a piece like that and it reminds them of the hunting experience they had growing up," Hummel says. "They get a piece of great art and have the satisfaction of knowing their money is making a difference on the ground."

Zabel is one of a new generation of Montana artists who are continuing the tradition of depicting scenes that inspire stewardship. Two others, born on the high plains, are Monte Dolack, who lives in Missoula, and Clyde Aspevig, a resident of rural Clyde Park near the southern flanks of the Crazy Mountains. "As an artist you try to reconcile the beauty of what you see and what you're hoping to save with the ever-expanding footprint of humanity that's continually being asserted on the landscape," Dolack says. "I want to convey some of that dynamic tension that exists between contradictions."

An avid fly-fisherman, Dolack has for years created special limited-edition lithographs for causes ranging from open space protection to conservation focused on elk, wolves, grizzlies, and native trout. Thousands of people around the globe own his often-whimsical posters—such as *Mirage*, which depicts dolphin-sized rainbow trout rising from sagebrush prairie to feed on flying magpies.

Aspevig is considered one of America's premier contemporary landscape painters. "What I do, and a lot of what I choose to paint, is based on the foundation of what's known as the Savannah Hypothesis," he

When The Land Belonged To God, 1914, by Charles M. Russell

OIL ON CANVAS. MONTANA HISTORICAL SOCIETY RESEARCH CENTER, HELENA. X1977.01.01 (PHOTOGRAPHER: JOHN REDDY, 1998)

says. "It deals with our innate desire to immerse ourselves in savannah-like settings, where we have water and widely spaced trees and can see out over long distances and are surrounded by animals." Such longings, Aspevig says, are deeply ingrained in the human psyche, dating to a time when early humans first roamed the African plains.

Because much of Montana's grassland landscape has the same characteristics as African savannah, Aspevig isn't surprised that those who live here are so deeply connected to the state's big, open country.

It was in large part his love of Montana's open plains that attracted the state's most famous artist to Big Sky Country. Charles M. Russell's paintings and watercolors chronicled a rapidly vanishing West at a time when interest in the disappearing frontier was at its zenith. His 1914 oil *When The Land Belonged To God* is considered the greatest masterpiece of homegrown wildlife art in Montana. The painting rests in the permanent collection of the Montana Historical Society (MHS). "Landscape is so much a part of our culture, and Russell's work epitomizes it," says Jennifer Bottomly-O'Looney, senior curator at the MHS. Another of her Russell favorites is *Lewis and Clark Meeting the Flatheads in Ross' Hole*, which, as in many of his paintings, includes several gray wolves watching from the sidelines. Painted in 1912, it is Russell's largest work, stretching nearly 25 feet across a wall in the chamber of the House of Representatives in the Montana state capitol.

Flores says Russell once wrote that settlers of the West had "marred its beauty," and he denounced those who killed off its wildlife and overexploited its forests and grasslands. With this knowledge, says Flo-

Mirage, 1993, by Monte Dolack
LITHOGRAPH. MONTE DOLACK ART GALLERY, MISSOULA, MONTANA

res, Russell's art can be viewed as a "painterly environmental history of the West." Restoring that landscape and its inhabitants, he says, is something to be embraced by all who appreciate Russell's paintings. "What was Charlie Russell trying to tell us?" asks Flores. "I argue that what he really did was prepare us for the modern world of possibility, where we have wolves back on the landscape, and healthy populations of grizzly bears, and Indians reaffirming their cultural heritage. If you have a sense of what once was, you can try to get there again."

Whether that is in fact what the Cowboy Artist hoped to convey is open to speculation. But Horse Capture, the Gros Ventre elder and museum curator, says there can be no argument that paintings by Russell and other great artists of Montana still resonate with people today. "It's all a matter of perspective," he says of painted images depicting Indian communities, cowboy life, and wildlife scenes that no longer exist. "They can make you sad and want to give up, or inspire you with a determination to make a positive difference. To me, art pulls us in the direction where we need to go."

To see modern renderings of traditional wildlife art, visit "Yellowstone to Yukon: The Journey of Wildlife and Art" at the Whyte Museum of the Canadian Rockies in Banff National Park, Alberta. The new exhibit of more than three dozen major oil paintings features portrayals of wildlife in Montana and Canada that include bighorn sheep, mountain goats, grizzly bears, elk, and wolves painted by Wyoming artist Dwayne Harty. Like expedition painters of old, Harty traveled for three years in the backcountry of the Northern Rockies. "I love Montana," Harty says. "Here you can still catch a glimpse of the truly wild West."

Building a better bear trap

Webcams, temperature sensors, and satellite technology allow FWP biologists to see and monitor what's in a culvert trap many miles away.

By Christine Paige

When Tim Manley receives a call from an apple grower who reports a grizzly raiding an orchard, the Kalispell-based bear biologist may have to drive an hour or more to the site to size up the situation. If he sets a culvert trap or snare to capture the nuisance bear, Manley then has to drive to the site at least once a day to check the device. Usually it's empty. Or he rolls up to find a skunk in the trap, or a bear cub caught with its frantic mother pacing nearby. Catching the wrong bear, known as a "nontargeted animal," is common, requiring him to release it and set up the trap all over again.

The same logistical problems challenge Montana Fish, Wildlife & Parks' four other bear biologists. Manley says it sometimes takes him or a colleague several weeks to trap a bear that has raided beehives, chicken coops, or garbage dumpsters and relocate the animal to where it won't get into trouble. "Trapping bears takes up a huge amount of our time," he says.

So in 2008, when Manley was asked to dream up the "ultimate" bear trap, he envisioned one that could be monitored live via a webcam and with a door he could control from the laptop computer at his office or home. Doing the asking was Ryan Alter, an entrepreneur based in Missoula. Alter is a natural tinkerer with a restless brain and a knack for problem solving. He's as comfortable machining metal and wielding a welder as he is fiddling with electronic gadgets and writing computer programs. Among other endeavors, Alter's company, Alter Enterprises, develops technological solutions for education, such as live-streaming presentations by experts in the field into science classrooms. It wasn't a stretch for Alter to start imagining the possibilities of a high-tech bear trap.

Alter took Manley's wish list and, using a generous grant from a private anonymous donor, went to work. Several months later he told Manley, "I've got your bear trap."

Built around a traditional culvert trap, the Automated Bear Trap (ABT) bristles with technology. It contains two webcams—regular light and infrared—that stream images of the trap's interior to a computer. When the trap door is tripped, the ABT sends an alert via a satellite link or cell phone base station to a set of FWP e-mail addresses. A bear biologist simply calls up the webcam on a secure website and views the animal in the trap.

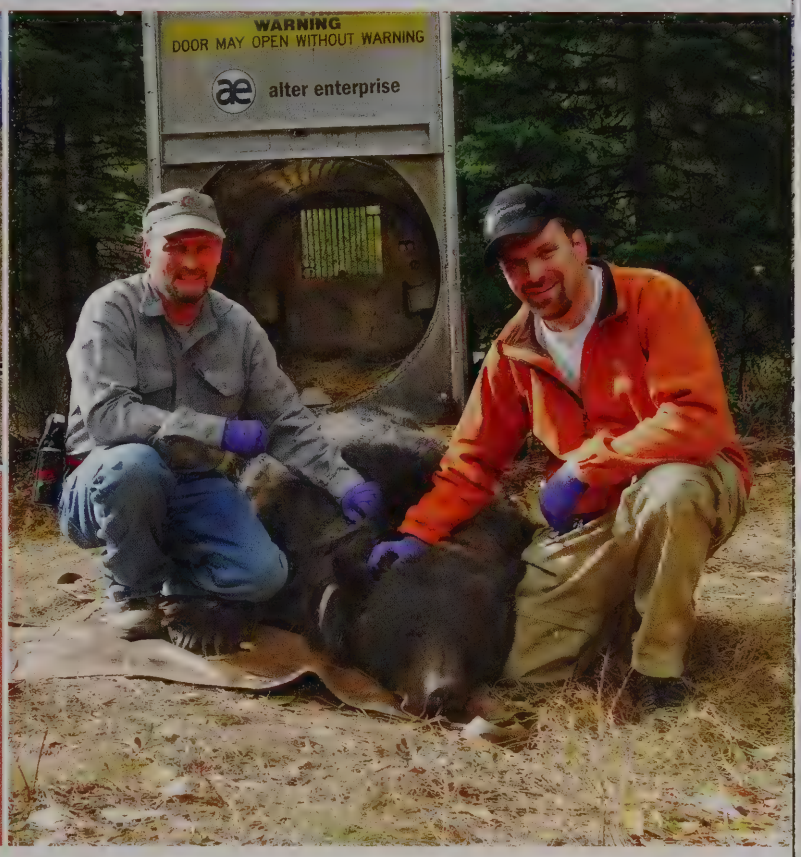
If it's the bear he's after, the biologist can immediately drive to the site, reducing stress on the captured animal. If it's the wrong bear that shows up on his computer or smartphone screen, a few keystrokes opens the door remotely, setting the animal free. If the bait is still intact, a few more taps is all it takes for the trap to be re-armed and ready to go again. "As long as we put the ABT in a place with cell phone coverage or we have the satellite dish up, we can control it from anywhere," Manley says.

The ABT is equipped with temperature sensors inside and out. Because a bear's body heat can raise the internal trap temperature as much as 10 degrees, biologists want to know if a trapped animal may be overheating on a warm day. If the temperature in the trap reaches levels dangerous to a bear's health, the ABT sends an e-mail alert and biologists can release the animal. Alter also installed an electromagnetic detector that reads a tiny microchip that biologists inject behind the ear of each bear they capture, like the microchip IDs used for pets.

CLOCKWISE FROM LEFT: ALTER ENTERPRISE; CHRISTINE PAIGE; ALTER ENTERPRISE; CHRISTINE PAIGE

Christine Paige is an independent wildlife biologist and a science writer who lives in Jackson, Wyoming.

TECH BELLS AND WHISTLES Clockwise from far left: A camera in the new Automated Bear Trap (ABT) shows a captured grizzly; the ABT with thin-film solar panels to produce energy, and a satellite dish for transmitting images and other information; FWP bear biologist Tim Manley and Missoula entrepreneur Ryan Alter with a sedated grizzly; a computer screen showing Manley peering into the ABT.



The ABT's technological bells and whistles are powered by a bank of 12-volt batteries charged by thin-film solar panels set on the ground next to the culvert. The panels are durable enough to withstand bears strolling across them, though Manley occasionally erects barriers to deter curious cows.

Over the past three years, Manley and Jamie Jonkel, FWP bear biologist in Missoula, have tested the ABT on both grizzlies and black bears with great success. The webcams help the biologists target individual bears, whether it's a sow with cubs getting too close to home sites, or a young male busted for breaking into chicken coops. The department has also used it to trap a few young female grizzlies in the robust Northern Continental Divide Ecosystem population that were then relocated to the tiny, struggling grizzly population in the Cabinets.

"The ABT is also good when you want to limit trips into closed areas of national forests," Manley adds. "And it's excellent for situations where you need to trap a specific bear but may have several others in the area you don't want to trap." The cameras and remote door release also make the trap safer for biologists.

During one field season, Manley estimated that the device saved at least 150 hours of his time and $5,000 in mileage.

During one field season, Manley estimated that the device saved at least 150 hours of his time and $5,000 in mileage.

Webcams also help with public outreach. When a bear trap is set, signs are posted nearby warning onlookers to stay away. But sometimes curiosity gets the better of folks, and human sightseers poking around bear traps put themselves in danger. By sharing webcam images of bears in and around the trap with local residents via e-mail, biologists reduce the public's temptation to sneak into the sites and take a peek.

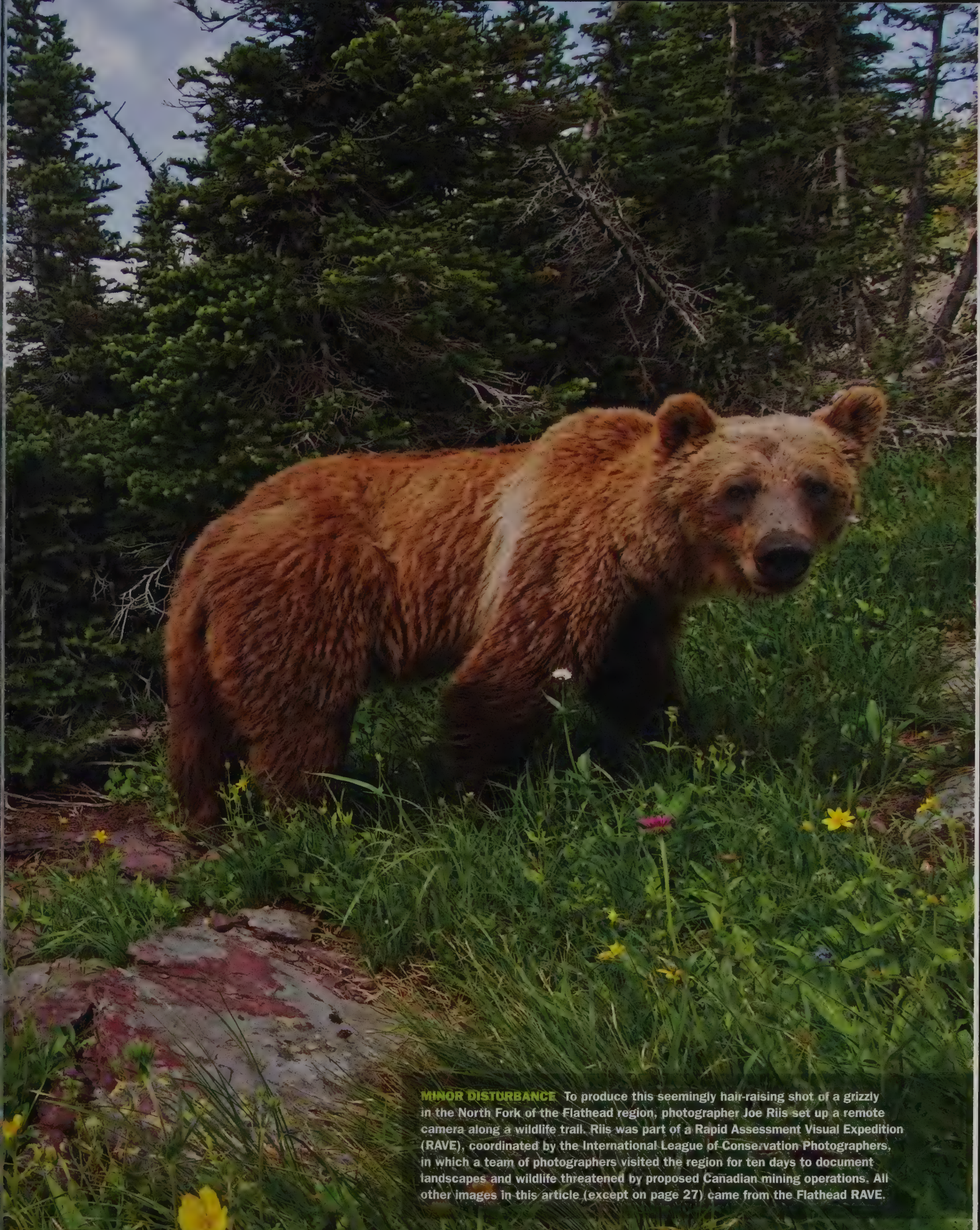
Though the ABT required a considerable investment of capital and research, the one-of-a-kind trap was donated to FWP. The department pays only for maintenance and data transmission.

Standard culvert traps and foot snares are the primary trapping tools of bear biologists and game wardens. That likely won't change. The devices are inexpensive, easy to set up, and do a good job of capturing bears. But in some cases, the ABT is a better tool. Not surprisingly, it has attracted the attention of bear management professionals elsewhere in Montana and other states. "There's been a lot of interest," says Manley. "The main concern is cost, but when they find out what I save in time and mileage, that becomes less of an issue."

Alter Enterprises recently received patent approval for the ABT, and Manley and Alter continue to work on improvements. The bear biologist says he'd like a weight scale mat installed on the culvert floor so he knows what a captured bear weighs and can more accurately estimate sedative dosage. He'd also like the trap to be modified and lightened so it can be hoisted into the backcountry by helicopter. "And maybe a mist cooling system..." Manley adds, his imagination clicking into gear.

HOW A GREAT PLACE WAS SAVED

Montana, British Columbia, Canada, and the United States work out a remarkable deal that protects the pristine North Fork of the Flathead region. BY SCOTT MCMILLION



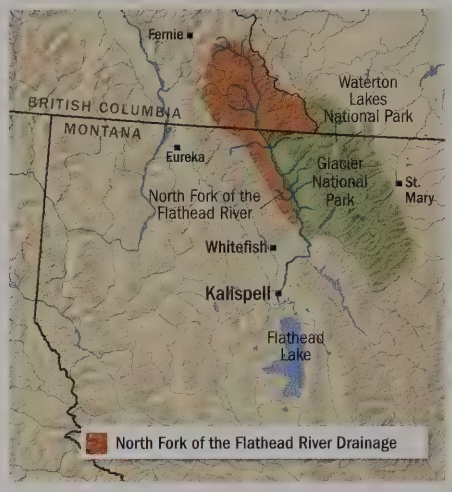
MINOR DISTURBANCE To produce this seemingly hair-raising shot of a grizzly in the North Fork of the Flathead region, photographer Joe Riis set up a remote camera along a wildlife trail. Riis was part of a Rapid Assessment Visual Expedition (RAVE), coordinated by the International League of Conservation Photographers, in which a team of photographers visited the region for ten days to document landscapes and wildlife threatened by proposed Canadian mining operations. All other images in this article (except on page 27) came from the Flathead RAVE.

The North Fork of the Flathead River carves a broad valley rimmed by stunning peaks and ridges. Wade into the water, even on a hot August day, and the coldness will make your shins ache. Dive in and it will punch the wind from your lungs. Look up at those mountains, where the snow never goes away, and you'll know why.

The river churns south from the Canadian province of British Columbia and splashes clear, green life into Montana, where the valley forms the western boundary to Glacier National Park. Mountain goats and grizzly bears sip from these waters. So do wolverines and lynx, elk and bighorns, pine martens and wolves.

Nobody lives in the Canadian North Fork and visitors are uncommon, even in hunting season. But the drainage is not unknown. Though wild, it's not wilderness. Old logging roads twine all over the place, but they've seen little traffic since logging ended in the 1970s and a flood in 1995 took out many of them. Brush and trees sprout in the ruts, reclaiming ground at their own pace.

Isolated though it is by geography, bad roads, and weather, the North Fork has been at the center of some of the continent's thorniest fights over development. For a century people have tried to pull fossil fuels from the ground beneath the valley—on both sides of the border—without much success. A well drilled in the early 20th century in what is now Glacier National Park didn't prove out. During a spike in energy prices in the 1970s and '80s, oil companies punched deep holes on the Canadian side of the border, seeking oil and gas. In the end, the prospective cost of building a permanent mining infrastructure up the wild, 80-mile-long valley kept drilling rigs at bay. In Montana, oil and natural gas developers purchased rights to drill along parts of the river.



Several proposals to develop the valley have resurfaced in recent years, but this time the plans were on a much larger scale. In 2005 Canadian companies announced plans to build massive coal mining operations—the kind that grind up whole mountains—near the headwaters of the northern end of the valley, and they spent millions of dollars exploring the deposits there.

The possibility of giant mining projects in such a wild area caused dark ripples on both sides of the border.

Getting wilder all the time

"You can spend a week or two up there in the summer and never see anybody," says Bruce McLellan, a grizzly bear researcher for British Columbia's Ministry of Natural Resource Operations who has been working in the Canadian North Fork since 1978. "It's even wilder now than it was when I first started working in there."

While wildness is shrinking almost everywhere, it is blooming in the North Fork. McLellan says the grizzly bear is a yardstick for measuring the health of this ecosystem. Glacier National Park is famous for its bears. And the Canadian North Fork has twice the park's grizzly density: That's one bear every seven square miles. Nowhere else in inland Canada boasts so many grizzlies.

The Canadian stretch of the North Fork—because it's so productive, so rich in wildlife—provides a source of predators for nearby areas, says McLellan. In fact, Glacier's first resident wolf pack since the 1930s, the Magic Pack, drifted in from the Canadian North Fork in the 1980s.

"The North Fork is the wildest mountain valley anywhere on the United States-Canada border," says Chris Servheen, grizzly bear recovery coordinator for the U.S. Fish and Wildlife Service. He's been researching bears and other carnivores in the area for 30 years. "Wildlife corridors don't stop at the border," he says.

"It's not just bears," adds Tim Thier, veteran wildlife biologist for Montana Fish, Wildlife & Parks. "It's one of the most important locations, to both Canada and the United States, for the movement of many wildlife species." Large-scale mining could pose particular threats to moose, Thier notes, because of the heavy traffic it would create. In winter, many moose would be

NIMBY (NOT IN MONTANA'S BACK YARD) **Fording Coal's "Greenhills" mountaintop-removal coal mine, in southern British Columbia north of Fernie. An agreement between the province and Montana helped prevent similar industrial mines from despoiling the upper Flathead Valley.**

CLOCKWISE FROM TOP LEFT: MAP: *MONTANA OUTDOORS*; VIEW FROM GRIZZLY WIDE PASS, B.C.: GARTH LENZ; NORTH FORK FLATHEAD TRIBUTARY: MICHAEL READY; GARTH LENZ

Canadian companies announced plans to build massive coal mining operations—the kind that grind up whole mountains—near the headwaters.

drawn to the easy passage created by plowed roads and wind up as roadkill. On a larger scale, putting industrial development in the middle of an unpopulated ecosystem could interfere with the genetic interchange that animal populations need to remain healthy.

And then there is the water.

The North Fork is a major tributary of Flathead Lake, likely the most pristine big lake in the West, says Jack Stanford, administrator of the University of Montana's Flathead Lake Biological Station. He offers this succinct description of mountaintop removal mining: "It's turning a mountain upside down and sorting through it." And that's what companies were proposing on the North Fork.

Modern mines are big enterprises. They need support, infrastructure, and supplies. A new town would likely spring up in this unpeopled valley. And even in the best-case projections of various environmental studies, such mines would disrupt wildlife migrations, create water pollution, and put an end to the valley's isolation. Especially vulnerable are the endangered bull trout and the westslope cutthroat trout. These fish are already in peril because they rely exclusively on this type of pristine river and its emerald pools: cold, clean, and increasingly rare.

Stanford's laboratory staff helped study the water above and below similar mines in British Columbia's Elk River drainage, just west of the North Fork. The downriver effects they measured were stark: They found that mining and associated activities raised nitrogen levels in the water 1,000 fold, sulfate levels 40 to 50 fold, and selenium 10 fold. The changes disrupted the river's ecological

GARTH LENZ

"It's turning a mountain upside down and sorting through it."

processes, and caused some aquatic creatures to disappear entirely. For example, if water contains too much nitrogen—a key nutrient for plants—it can fuel algal blooms, which soak up the water's oxygen and suffocate fish and other creatures.

And that was without any major catastrophes, like floods, avalanches, or blowouts of containment dams.

The Canadian mines likely would have directly affected Flathead Lake, 100 miles to the south, according to Mark Delaray, FWP fisheries biologist in Kalispell. "These are fish that Montana and British Columbia share," he says, adding that bull trout and westslope cutthroats spawn in the North Fork's upper reaches, "right in the immediate vicinity of the mine site." Later in life, those fish swim downstream to Flathead Lake, where they grow to maturity. "It's a key habitat for the survival of Flathead Lake fish," Delaray says.

Delicate diplomacy

When Canadian companies once again proposed mines in the North Fork headwaters in 2005, officials in Montana knew the

This isolated valley—flanked by national parks on both sides of the border—will continue to be little known, hard to reach, and very productive for wildlife.

state's citizens would expect them to act.

Grizzlies, wolves, elk, and wolverines know nothing of the border. The river, too, travels without a passport. But for humans, that national boundary can be a tall hurdle. Protecting the North Fork meant asking British Columbia officials to walk away from billions of dollars in potential royalties and taxes the mines would produce.

Montana Governor Brian Schweitzer reached out to then–British Columbia Premier Gordon Campbell. Building on past collaborations on a number of cross-border issues, the two began working on the state and provincial level to find a solution to the North Fork dilemma.

Negotiations moved in fits and starts, Schweitzer says, but the state, the province, and the U.S. and Canadian governments, with lots of help from Canadian Ambassador to the United States Gary Doer, eventually worked out a deal.

Early in 2010 Schweitzer and Campbell announced some big news. From that day, they said, the prospect of moving mountains to extract coal, gold, gas, and oil—and the traffic, disruption, and pollution that accompany these projects—would no longer be a possibility in the Canadian North Fork. The mining companies had agreed to abandon their Canadian claims if they could be compensated for what they had spent on exploration. That amounted to just under $10 million.

It seemed like quite a bargain. In exchange for $10 million, the two countries could help protect nearly 400,000 acres. That's only $25 an acre, not counting British Columbia's decision to walk away from potentially $5 billion to $7 billion in taxes and royalties on the minerals. "Most of the credit for this agreement needs to go to Premier Campbell," says Schweitzer.

Meanwhile, Montana Senators Max Baucus and Jon Tester had begun to persuade oil and gas companies to withdraw their leases on the U.S. side of the border. Most of the companies did so quickly, a decision no doubt affected by earlier court rulings that said the leases couldn't be exploited without a lot of extra environmental analysis.

BIG NEWS From left to right: Michel Kenmille of the Confederated Salish and Kootenai Tribal Council, Montana Governor Brian Schweitzer, British Columbia Premier Gordon Campbell, and Kathryn Teneese, chair of the Ktunaxa Nation Council, announce an agreement on the North Fork of the Flathead drainage. Mining companies agreed to abandon their claims if they could be compensated for previous exploration expenses.

Still, U.S. officials had a hard time coming up with their share of the money. Baucus says Secretary of State Hillary Clinton and Interior Secretary Ken Salazar took great interest in the project. But there was a concern in Washington about the U.S. government setting a precedent by compensating foreign companies for their expenses in a foreign country.

Where the money came from

That's when The Nature Conservancy (TNC) and its unaffiliated partner, the Nature Conservancy of Canada, offered a solution. If the countries would protect the North Fork, the two nonprofit organizations would raise the $10 million needed.

"The deal was all done," Schweitzer said. "It was just a matter of where the money was going to come from. I give the greatest kudos to The Nature Conservancy and the Nature Conservancy of Canada. Had it not been for them stepping in, I think the deal would have been doomed."

> **"What this package does is remove the big threats, the killer threats."**

Richard Jeo, who directs TNC's Canada Program, says the organization was a natural player. It had worked for more than a decade on a variety of projects along the Crown of the Continent, the vast swath of mostly wild lands along the Continental Divide. The North Fork is a key component of the Crown. "It became clear that the deal needed money, so we offered to help," says Jeo.

And the clock was ticking: In 2010, when Schweitzer and Campbell announced the memorandum of understanding that outlined the deal, the agreement called for committing money to the mining companies within a year. "The year was almost up," says Kat Imhoff, TNC's state director in Montana, when the two conservation groups agreed to provide the money.

To further demonstrate U.S. commitment, Senators Baucus and Tester have sponsored legislation that would permanently withdraw the American stretch of the North Fork Valley from oil and gas development. When the U.S. companies walked away from their leases, they did so "with the understanding that nobody would turn around and lease them again in the future," Tester says.

To put icing on the cake, the government of British Columbia approved legislation in November 2011 that permanently withdraws the North Fork from mining and oil and gas development.

With this deal in place, the North Fork will remain an intact part of the vast Crown of the Continent ecosystem. This remote valley—flanked by national parks on both sides of the border—will continue to be little known, hard to reach, and very productive for wildlife.

"What this package does is remove the big threats, the killer threats," Jeo says.

And that lets the North Fork Valley keep doing what it does, converting old roads into forest, succoring rare creatures like grizzlies and wolverines, feeding elk and deer and fish, and pouring cold, clean water downstream.

"It's doing fine right now," says McLellan, the grizzly researcher. "If it stays like it is for another 100 years, I'll be happy."

Scott McMillion, of Livingston, is a freelance writer and a senior editor for Montana Quarterly. *This article is adapted from one that originally appeared in* The Nature Conservancy *in 2011.*

CLOCKWISE FROM TOP LEFT: NORTH FORK FLATHEAD DRAINAGE: GARTH LENZ; MONTANA GOVERNOR'S OFFICE; WESTSLOPE CUTTHROATS: MICHAEL READY

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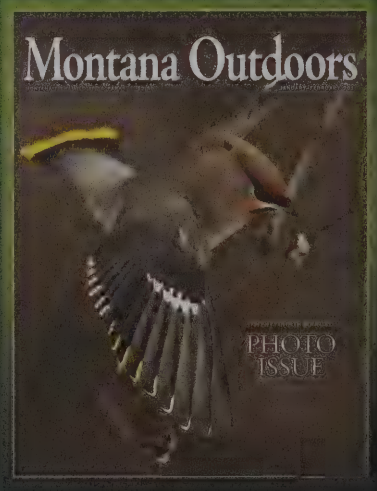

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Love Birds

Spectacular springtime courtship displays of 12 Montana species

By Ellen Horowitz

To really get to know a bird species, you can learn its shape, color, and flight patterns. Or you can identify its unique songs. Another way, perfect for this time of year, is to observe the bird's unique courtship behaviors.

Each spring, as days lengthen and temperatures warm, birds begin to search for mates. Males, in most cases, use voice, postures, and displays to advertise their strength, health, and suitability as a breeding partner. These behaviors can also announce territorial boundaries and warn rivals to stay away. Each species has a unique courtship ritual.

Some court in the air with sky dances, cartwheels, and roller-coaster flights. Others display on the ground by leaping, twirling, or bowing, or by clapping their wings, stomping their feet, or beating their chests. A few dance beak to beak. Some even produce non-vocal love songs—instrumentals played between feathers and wind.

What follows are 12 of my favorite bird courtship rituals, including where and when you might see them for yourself.

Sandhill crane

These tall, majestic birds use a courtship dance to select a mate and reinforce the bond a pair maintains for life. (Like other "lifelong" maters, if one bird dies the surviving crane seeks a new partner.) Sandhill cranes' complex choreography consists of pirouetting, leaping, exaggerated bowing, spread-wing hopping, and head pumping. Sometimes a bird uses its bill to flip a stick or weed into the air, as if tossing a wedding bouquet. One pair of dancing cranes can inspire an entire flock to join the activities.

Though the male is similar in appearance to the female, he is typically larger and has a deeper voice. Various loud croaking and rattling calls, including duets, are part of the sandhill cranes' courtship ritual and can be heard up to a mile away.

Where: Statewide in open grasslands and marshes
When: Early April to mid-May

Calliope hummingbird

The smallest bird in North America exhibits a big attitude when it comes to defending territory and wowing prospective mates with his displays. When wooing a female, a male zooms downward at speeds of 60 miles per hour. During his U-shaped dive, which may be repeated up to 20 times in succession, he passes over a female and performs a barrel roll. The encore performance takes place on an invisible stage in front of and slightly above the perched female. During this "shuttle display," the male expands his glimmering magenta throat feathers while hovering, his rapid wing strokes producing a pulsating buzz. The enamored female may then join him in a dance where they whirl in aerial circles with bills touching.

Where: Western Montana along forest edges near dead branches or treetops
When: Late April to early June

Short-eared owl

The male performs his sky dance almost any time of day or night beginning in late winter. With slow, mothlike wing beats, he flies higher and higher in small circles, attaining a height of up to 300 feet. Then he hoots a courtship song, a pulsing *voo-hoo-hoo*—which some say resembles the sound of an old steam engine—before descending. During the dive he strikes his wings together beneath his body, producing a series of quick claps (resembling the sound made by a small flag fluttering in a strong wind). Just before reaching the ground, the short-eared owl swoops upward to repeat his aerial dance. Occasionally, a female joins the male for a courtship flight.

Where: Statewide in open country, grasslands, prairies, meadows, and marshlands
When: February through April

Ellen Horowitz is a writer in Columbia Falls. Her last Montana Outdoors *article, "Pursuing the Elusive* Orchidaceae," *won a first place award from the Outdoor Writers Association of America.*

Bald eagle

Though these large raptors typically stay with the same partner for life, each winter a pair will reestablish its bonds with midair displays. One of the most animated aerial antics is known as roller-coaster flight, performed by males to warn off rivals and impress females. The eagle soars high into the sky then folds its wings to dive at high speed. Just before reaching the ground, he swoops up and resumes the sequence. From a distance the rising and falling bird looks like he's riding an amusement park roller coaster.

During what's known as a cartwheel display, an eagle pair flies high into the sky, locks talons, and tumbles toward earth. The birds release their grasp just before striking the ground, then they return skyward with powerful wing beats to repeat the maneuver.

Talon grappling can also be a form of aggression between rival males. Other male birds, including ravens and short-eared owls, also aggressively lock talons during mating season.

Where: Statewide along rivers and lakes
When: January through March

Common goldeneye

The male goldeneye begins courting a female by jerkily thrusting his head forward as he swims, looking as though he's trying to cough up something lodged in his throat. Then he abruptly tilts his head back onto his back with his bill pointing straight skyward, repeating this numerous times. As part of his display, he kicks both feet backward, splashing water into the air. A female smitten by the displaying drake may follow and imitate some of his moves.

Where: Western and northern Montana lakes and large rivers
When: Mid-April to late May

Ruffed grouse

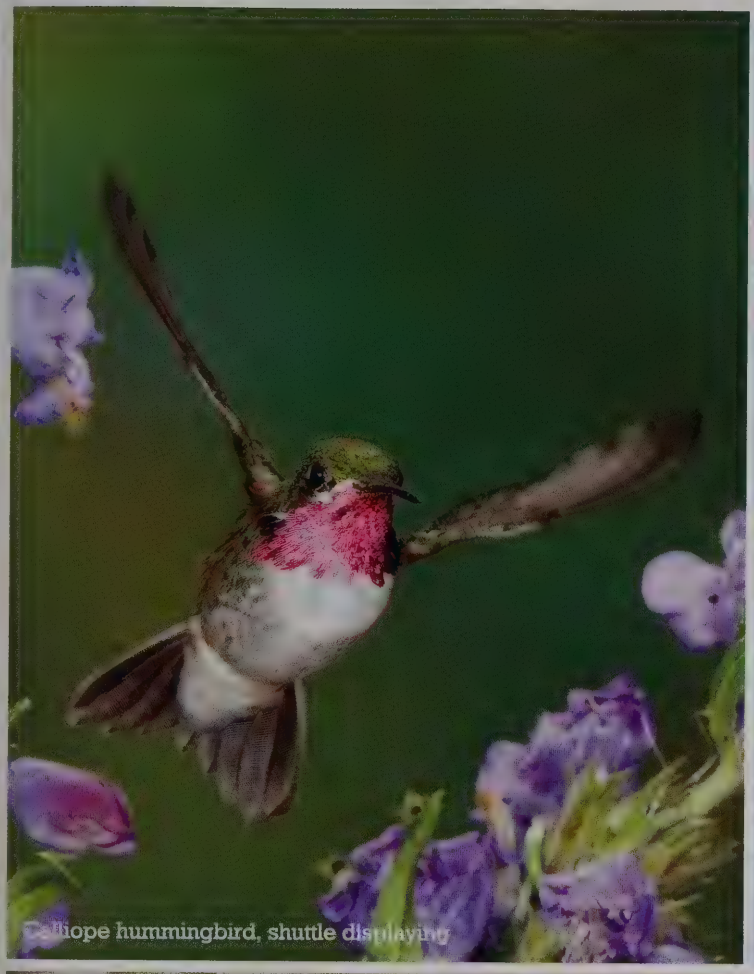
A downed log is usually the stage for this forest performer. While standing on his platform, the male ruffed grouse erects the dark-colored ruff around his neck, fans his tail, and starts drumming. With wings cupped, he beats the air in a forward motion to create a deep, hollow *thump-thump-thump*. Over the next several seconds the grouse drums progressively faster, producing a low-frequency sound resembling that of a lawnmower engine and audible from up to half a mile away.

Ruffed grouse are highly territorial. The drumming advertises the male's real estate and warns other males to stay away. It's common for competing males on neighboring territories to drum back and forth all morning. Drumming also sends an invitation to nearby hens. When an interested female approaches, the male shows off by raising the crest on his head, fluffing his neck feathers, flaring his tail, and strutting.

Where: Western Montana in brushy mixed conifer and aspen forests, often along stream bottoms
When: Late April to mid-June

Short-eared owl, sky dancing

CLOCKWISE FROM LEFT: ANDREW KANDEL; ALAN G. NELSON; KEN ARCHER; STEVE MITCHELL; CINDY GOEDDEL

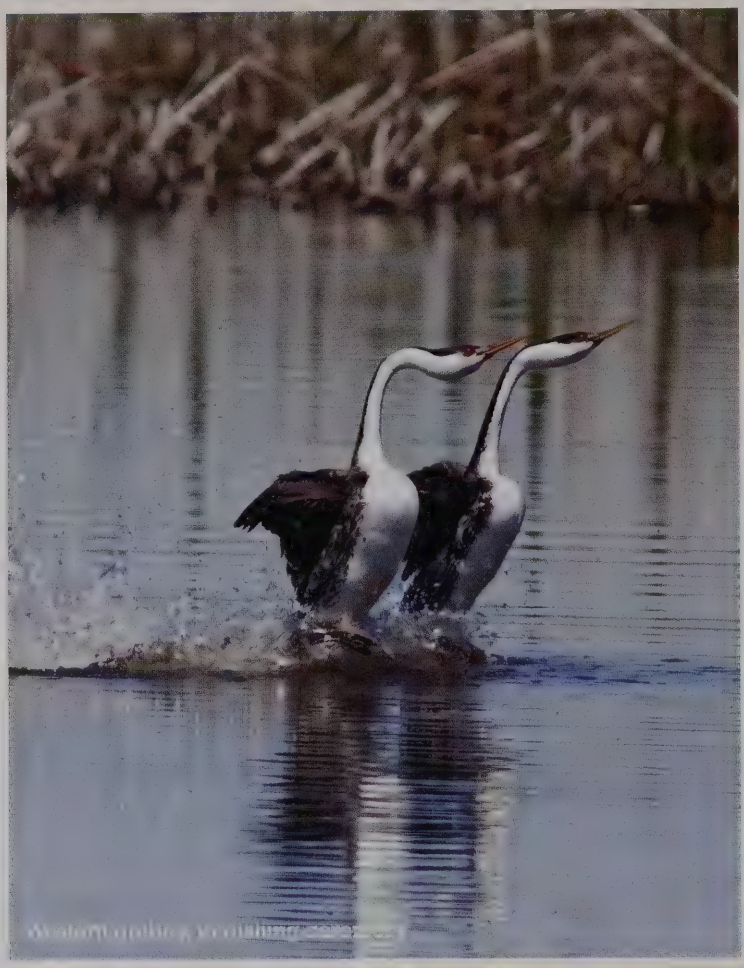


Calliope hummingbird, shuttle displaying

Bald eagles, cartwheel displaying

Ruffed grouse, drumming

Common goldeneye, splashing with head tilted back



Great blue heron, displaying mating plumage

Ruddy duck, bubbling

Wilson's phalaropes, male atop female

Ruddy duck

The drake ruddy duck's oversized blue bill, stiff upturned tail, and rust-colored body make him easy to recognize. He also has the thick neck of a linebacker and sports two feathered "horns" on his head.

He begins his unique courtship routine, called "bubbling," by puffing his breast feathers then beating them progressively faster with the underside of his bill. Air forced from the feathers creates bubbles in the water directly in front of his breast. The male uses the bubbling display to ward off rivals and attract females.

Ruddy ducks are among the few species of stiff-tailed ducks in the world. During the bubbling display, the male holds his long, stiff tail straight up to impress a female.

Where: Statewide in marshes, ponds, and lakes
When: Mid-April to late May

Wilson's snipe

The hollow, low-whistled sound of the male snipe's love song is produced by its thin, curved tail feathers during the bird's high-speed aerial dives. This mottled, robin-sized bird flies hundreds of feet into the air with rapid wing beats. During his daredevil descent at 25 to 50 miles per hour, he flaps his wings to maintain his balance against the force of wind on the splayed tail feathers. As the outside feathers vibrate, they create a tremulous sound called "winnowing." This haunting *who-who-who-who* broadcasts from different parts of the sky as he flies and dives in a circuitous route. Snipe display most actively in morning and evening. During a full moon, these high-flying suitors winnow all night. To further impress females, they sometimes fly upside down for short distances.

Where: Statewide in marshes, wet meadows, and wet pastures containing tall grass for hiding cover
When: Mid-April to mid-June

Western grebe

Neck stretching, head shaking, bill dipping, and crest raising are all part of this grebe's courtship displays. But some of the most spectacular behavior involves the "rushing ceremony." Here a male and a female, swimming side by side, lunge forward until their bodies rise completely out of the water, and then run across the surface.

The courting couple also perform the "weed ceremony." This involves stretching their necks and shaking their heads before diving for underwater vegetation. With aquatic plants dangling from their bills, they raise their bodies out of the water, stretch their necks, and place chests and bills close together while dancing in circles. The ceremony ends when the vegetation is shaken free. Then the birds dive and swim off.

Where: Statewide in marshes, ponds, and lakes
When: Mid-April to early June

Wilson's phalarope

This is one of the few bird species in which the female is more colorful and initiates courtship. Female phalaropes aren't territorial, but they do fight over an available male. Several pursue him as he swims nervously along a pond's edge. The dominant female swims closest to the male and drives off rivals. Aggressive posture and behavior by these shorebirds include forward and retracted head movements and aerial chases. When a pair bond is established, the courting couple bow to each other and extend their beaks skyward.

Once she has finished laying eggs, the female leaves for good. The male incubates the eggs and cares for the young.

Where: Statewide along freshwater ponds and marshes
When: Mid-April to early May

Sharp-tailed grouse

Male sharptails compete for female attention on dancing grounds known as leks. With wings outstretched, tails pointed upward, heads extended forward, yellow eye combs erect, and lavender neck air sacs inflated, male sharptails begin to dance. The birds rapidly stomp their feet up and down—moving slightly to the left, to the right, and then forward—their vibrating tails rattling. They look like wind-up toys. A dozen or more may dance together in the open area then stop simultaneously as if part of a rehearsed choreography. Periodically a bird flutter-jumps.

Females interspersed among the dancers appear bored, but they're actually judging and deciding with whom they'll mate. The best dancer, dominating the center of the lek, will breed most of the nearby females.

Male vocalizations during the dance include coos, clicks, cackles, whines, gobbles, and cork-popping sounds. When heard in unison, it resembles what my husband describes as "Martian talk."

Where: Eastern and central Montana grasslands with some shrub cover
When: Mid-March to mid-May

Great blue heron

Each spring herons congregate in nesting colonies, usually cottonwood groves near rivers. A male builds a new nest or repairs an existing one. His mating display is intended in part to defend the nest from interlopers.

The most common display of these elegant wading birds is the "stretch." The male heron gracefully lifts his head and long, slender neck until his bill points skyward, uttering a *gooo-gooo* sound. In this stance, swaying gently, he shows off his magnificent mating-season neck plumes, colored skin around the eye, and bright yellow bill. The female sometimes mimics this display when a male offers her a stick to add to the nest.

A male great blue heron also shows off the long, sleek plumes of his head, neck, breast, and back during the "snap" display. Here he extends his head straight forward and rapidly opens and closes his beak, creating a snapping sound.

During another part of the mating display, the male and female whack their long bills together, as if in swordplay.

As with other bird species, herons should not be bothered during mating and nesting season. Please keep your distance.

Where: Most nesting colonies found in cottonwoods along major rivers and lakes throughout Montana
When: Early March to late April

CLOCKWISE FROM TOP LEFT: DIANA LEVASSEUR; EVAN GRAFF; BILL MARSIK; FRANCIS & JANICE BERGQUIST

Shining a light on MOOSE

Are these popular big game animals disappearing from parts of Montana? FWP research biologists search for better ways to track population trends while learning what causes the large, long-legged forest dwellers to die.

BY TOM DICKSON

Every year during his three decades as the area wildlife biologist in Thompson Falls, Bruce Sterling has faced a moose management dilemma. "On one hand, I wonder if I'm issuing more hunting licenses than the moose population can support," he says. "On the other, if the population can withstand a higher harvest and I don't issue enough licenses, I'm denying hunters the hunting opportunity of a lifetime."

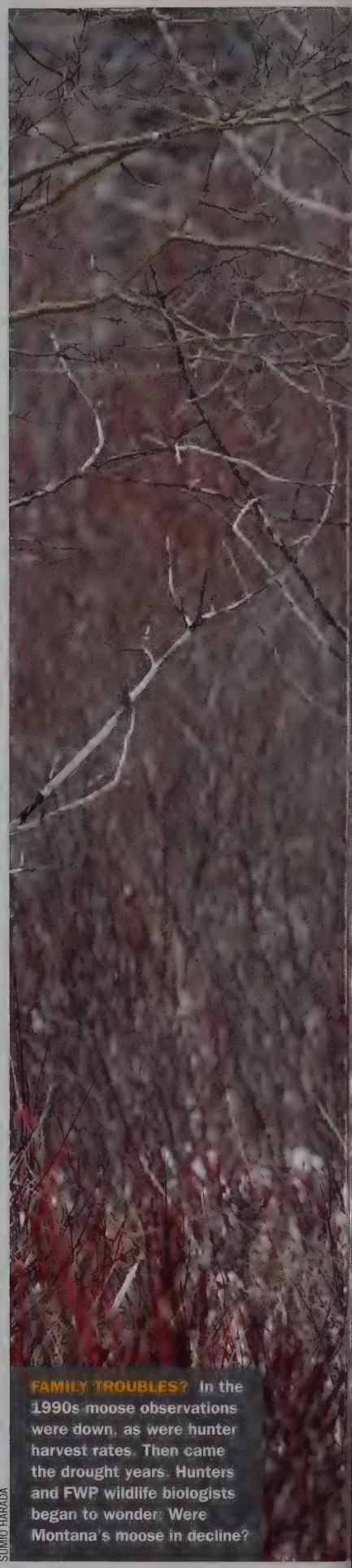
Sterling isn't alone. Across Montana's moose range, wildlife managers hampered by sparse data struggle to manage the large, charismatic game animals. Most frustrating is not knowing how moose populations are "trending," or increasing or decreasing in size. Without that data, biologists can't know with certainty to what extent they should increase or decrease hunting harvest from year to year, according to Justin Gude, head of FWP wildlife research. What's more, says Gude, "if they don't know which factors are driving populations, whether it's predators or habitat succession or something else, they have a tough time knowing how to respond when moose numbers start dropping."

MOOSE UNDER THE RADAR

For decades moose management in Montana ambled along much like moose themselves—slowly, quietly, and largely out of view. *Alces alces* is a popular animal. A sighting can be the highlight of a vacationer's summer, and hunters compete for scarce moose tags. Each year roughly 25,000 hunters apply for the 500 to 1,000 moose hunting licenses that FWP provides. Yet abundant elk and deer attract far more attention from hunters, wildlife watchers, and FWP biologists. In 2010, hunters shot 25,000 elk and 95,000 white-tailed and mule deer combined. The moose harvest was just 292.

Moose emerged into the spotlight in the mid-1990s, when hunters and landowners began reporting fewer of the animals in parts of western Montana. At the same time, hunter harvest success rates began declining, and successful hunters spent more days afield to kill their moose. Then came the drought and high temperatures of the 2000s.

Moose require cold, wet climates, making much of Montana too warm and dry for their survival. During the drought years, summer



FAMILY TROUBLES? In the 1990s moose observations were down, as were hunter harvest rates. Then came the drought years. Hunters and FWP wildlife biologists began to wonder: Were Montana's moose in decline?

SUMIO HARADA

and winter temperatures hit record highs while rain and snow were sparse. In another moose state, Minnesota, biologists had begun documenting moose population declines during the drought decade. It seemed logical the same would be true in Montana.

What's more, logging and wildfires had been curtailed. In previous decades those forest disruptions had opened large chunks of canopy to sunlight, boosting growth of the willow shrubs that moose eat in winter. Now those early succession forests were aging. To top it off, wolves, black bears, grizzly bears, and mountain lions were increasing across Montana's moose range. Adding up the anecdotal evidence, it appeared that moose might be in trouble. "The thing is, we didn't know for sure," says Gude. "And if populations were in fact declining, we didn't know why. We needed to find out."

Other moose states and provinces with similar concerns had begun searching for answers. In recent years Minnesota, Ontario, North Dakota, Wyoming, and Utah had evaluated the status and management of their moose populations and begun field research to learn more. Now it was Montana's turn.

CENTRAL CLEARINGHOUSE

FWP's first step was to consolidate the department's moose information. Because no FWP biologist was dedicated solely to moose, information was scattered among more than a dozen area offices. Data resided in typed reports, computer files, and even hand-written field books half a century old. To do the legwork, Gude hired Ty Smucker, a research associate at Montana State University's (MSU) Ecology Department. Smucker's job was to interview state and federal biologists in Montana's moose range and pore over survey information, harvest reports, and other data. The goal was to identify knowledge gaps hampering moose conservation and management.

Most biologists told Smucker that moose populations in their area appeared to be either stable or decreasing. Declines were particularly alarming in the Gallatin and Big Hole Valleys, historically moose strongholds. Smucker found some exceptions. Gary Olson, wildlife biologist in Conrad, reported seeing more moose along the Rocky Mountain Front in recent years than at any time during his 34 years working there. And Ryan Rauscher, wildlife biologist in Glasgow, was seeing growing numbers of moose in the state's northeastern region, likely migrants from Saskatchewan.

Statewide harvest data that Smucker compiled told a grimmer story. The number of FWP-issued moose permits statewide dropped 48 percent from 1995 to 2010, from 769 to 395. Success rates also dropped, from an average of 85 percent in the 1990s to less than 70 percent in 2009. And

Tom Dickson is editor of Montana Outdoors.

REGAL RACK Montana's Shiras moose is the smallest of the four moose subspecies. Alaskan moose may weigh 25 percent more and sport much larger antlers. Even so, Shiras moose remain a coveted trophy in Montana for both hunters and wildlife watchers.

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MONTANA'S SHIRAS MOOSE

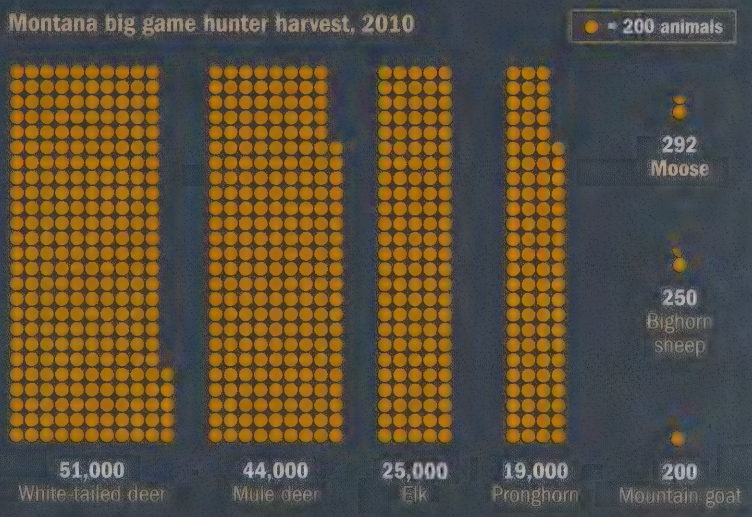
RIGHT Though popular, moose comprise only a tiny portion of Montana's big game harvest each year. As a result, moose management for years took a backseat to elk and deer.

Over the past 25 years, moose hunters have been less successful even while putting in more effort.

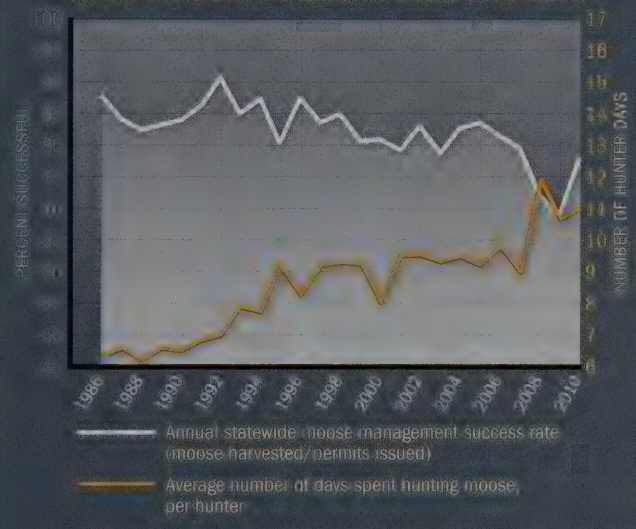
Though some moose hunting is available throughout much of Montana, almost all harvest is west of the Continental Divide.

Though moose harvest peaks and valleys over the past half-century are not uncommon, declines since the mid-1990s have worried biologists, hunters, and others who like to see the large, long-legged animals.

Montana big game hunter harvest, 2010

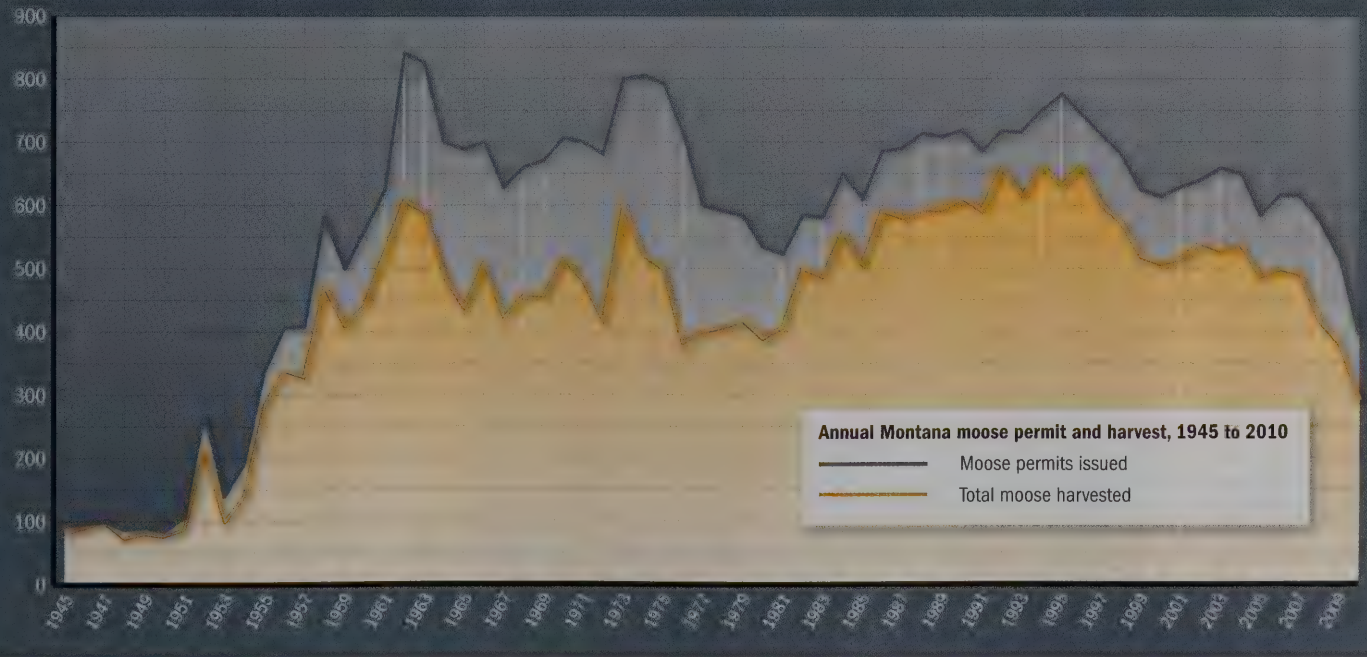


Moose success rate and hunter effort, 1986–2010


PERCENT SUCCESSFUL
NUMBER OF HUNTER DAYS
Annual statewide moose management success rate (moose harvested/permits issued)
Average number of days spent hunting moose, per hunter

Moose permits by region, 2010

Region 1	Region 2	Region 3	Region 4	Region 5	Region 6	Region 7
155 permits	45 permits	236 permits	13 permits	10 permits	2 permits	0 permits
33%	10%	51%	3%	2%	<1%	



successful hunters required more days to bag a moose than in previous years, from an average of 6.5 days in the late 1980s to about 10 in the first decade of the 2000s.

Whether these figures reflected a declining statewide population was open to debate. In most of the state's moose range, biologists say they can only guess at local population numbers and trends. "And when there's doubt, biologists have to be very conservative with the harvest quotas they set," says Gude.

For an animal that can weigh 1,000 pounds and stand 6 feet at the shoulder, a moose is surprisingly hard to spot, even from the air. Moose stay in thick timber, which is cooler in summer and warmer in winter and where their dark coats render them nearly invisible. Moose are best viewed from the air, during winter, but even then they emerge into open areas infrequently.

292
Total Montana moose harvest in 2010

Smucker found that in most of Montana, biologists have done at least some aerial moose monitoring. Unfortunately, the results often have limited value for estimating population trends. The most consistent helicopter and airplane surveys occur in the Cabinet, Purcell, and Yaak areas in the northwest and the upper Big Hole Valley and Gravelly Complex (Ruby River and Centennial Valleys) in the southwest. "Most other survey work was spotty—done at widely varying times of year, or in small areas, or without information on snowpack or other factors that influence moose concentrations in winter," Smucker says.

After analyzing the findings, Smucker, Gude, and MSU ecology professor Bob Garrott concluded that in order for FWP to set harvest quotas with more confidence and respond to population declines, the agency needs two things: additional and more-reliable information on long-term moose population trends; and a better understanding of how predation, habitat, disease, parasites, and climate affect moose populations. An FWP research project starting this year is designed to provide that information.

FINDING BETTER WAYS

Ideally, each biologist in moose range could request a piloted helicopter at a moment's notice when viewing conditions are optimal. But aerial survey work is costly, time consuming, and hard to predict. A goal of the new study is to find less expensive ways of estimating population trends.

FWP biologists currently use hunter harvest information, gathered each fall at check stations and in winter from phone surveys. Yet no one is sure how the information corresponds to moose population trends. "Just because only 60 percent of moose hunters in a hunting district were successful doesn't necessarily mean there weren't many moose there," explains Vanna Boccadori, FWP wildlife biologist in Butte. "It could be that hunting conditions were particularly bad that year, or that trophy hunters were passing on smaller bulls."

The new study will compare harvest data over the past several decades to aerial surveys in portions of southwestern and northwestern Montana that have long-term survey data. Researchers will see if harvest success increases in years when biologists spotted more moose from the air during the previous winter. And, if so, are the two rates of increase similar? If the moose researchers can detect a strong statistical correlation, then biologists who don't do aerial surveys could make better use of hunter harvest data to estimate population trends.

Another way to determine population trends may be to track observations of moose by elk and deer hunters. Researchers in the new study will compare hunter observations with aerial population surveys to see how well the two match up. "If there's a strong correlation, that could be real helpful, because with hunters you have a lot of accurate eyeballs out there," says Sterling, the Thompson Falls biologist.

Researchers will also examine how accurately aerial surveys reflect actual moose numbers on the ground in various habitat types. "When I'm flying, I assume I'm seeing at least the majority of the moose population down there," says Boccadori. "But I'm not certain, so we need to test that assumption."

Researchers will also look at the feasibility of surveying moose in "trend areas" that could reflect larger populations. And they will determine if tracking survival rates of moose cows and calves can provide insight into population trends. "The bottom line for the monitoring portion of the study is to find ways for us to get accurate moose population trend estimates without spending extra money," says Gude.

The study's other half will look at factors driving moose survival. Over the next three years, FWP's new soon-to-be-hired moose research biologist and other FWP staff will capture and radio-collar 30 cow moose in each of three study areas—the East Cabinets south of Libby, the Beaverhead Mountains of the upper Big Hole, and the Rocky Mountain

LINKING HARVEST TO POPULATIONS
Does an increase in hunter harvest indicate a growing moose population? FWP biologists aren't sure. A new study should help answer the question.

HEADING FOR SAFETY One goal of a new multiyear FWP study is to learn what causes moose to die. Inadequate habitat? Predators? Parasites? Other factors? "We can't help moose if we don't know what's driving survival rates," says one biologist.

Front from western Teton County northeast to the Sweet Grass Hills. They will then monitor the fate of those moose during the next seven years. "If we don't know what drives moose survival and recruitment [the percentage of young that survive one year], then we don't know how to respond if numbers are declining," says Gude. "Do we increase predator harvest? Work with landowners and federal agencies to improve moose habitat? Decrease hunter harvest? We can't do everything, and some things are much harder and more expensive than others. We need to know if they are worth doing."

Researchers' other goals for the ambitious ten-year study:

- Learn how various habitats affect moose survival. Researchers will analyze fecal pellets to learn what plants moose are eating. To track the nutritional quality of those foods, they will use ultrasound equipment to measure body fat in captured moose and monitor the percentage of cow moose that give birth to twins.
- Find out to what extent parasites such as brain worms (carried by white-tailed deer), arterial worms (carried by mule deer), liver flukes, and winter ticks are killing moose.
- Examine how heat affects moose, which become stressed at temperatures above 23 degrees Fahrenheit in winter and 59 degrees in summer.
- Learn if bears are killing a higher proportion of newborn moose along the Rocky Mountain Front and East Cabinets, where bear numbers are higher, than in the upper Big Hole.
- Determine whether predation by wolves is higher in the East Cabinets, which consistently has a higher number of wolves than the other two study areas.

If researchers can secure additional funding, they will also try to determine the cause of moose calf mortality. In each of the three study areas, researchers will capture and radio-collar 30 newly born moose and track the animals over the following year to learn the cause of any deaths.

Gude says the research team will share their findings with biologists throughout the study period. "This entire project is driven by management needs," he says.

For Sterling, the information won't come a moment too soon. "Right now, I have very limited data on the number of moose out there," he says. "What we need is a better comfort factor when we're setting quotas. That's what we want, and that's what hunters want."

LEFT TO RIGHT: PAT MUNDAY; JOE MCDONALD

Inside the bear nursery

By Bruce Auchly

You didn't receive a birth announcement, but near the end of January, as they do every winter, hundreds of pregnant grizzly bears and black bears gave birth in their winter dens.

Each litter averages two cubs, born tiny and helpless like human babies. But that's where the similarity ends.

A grizzly's average weight at birth is 1 pound. Black bears average half a pound. The average newborn baby weighs 7.5 pounds.

Cubs are blind and nurse on rich milk that is 20 to 40 percent fat, while babies can see at birth and nurse on human milk with 4 percent fat. The mother bear, still half asleep in partial hibernation, stimulates urination and defecation by licking the cubs' anal areas (and human mothers think they have it tough).

The mother grizzly wakes from her deep sleep from time to time—to give birth, eat the placenta, and clean up her newborns. Wildlife scientists are still not sure if she ever fully comes out of hibernation until spring.

The cubs never hibernate. Instead, they spend their first winter drinking the mother's milk and growing.

Right now, in March, mom is still asleep and the cubs are awake.

At emergence, a few months from now, a sow with cubs may have lost 30 to 40 percent of her body weight, while females without cubs may have lost only 15 to 20 percent. Cubs weigh about 8 pounds when they emerge, but will weigh 20 to 30 pounds by summer, depending on their diet.

In most of Montana's 26 bear management units, spring black bear hunting closes May 31; the rest close May 15. Part of the reason is to help hunters avoid shooting a female with cubs, which is illegal. Females with cubs usually emerge from their dens around the end of May.

Bears do not have a rigid schedule for going into hibernation. Generally, pregnant females are the first to enter their winter dens and adult males are the last to enter theirs.

Denning occurs any time from October through December, depending on weather and availability of food. In years when food is scarce, some bears may den earlier.

When a pregnant bear goes into her den, she is only a little bit pregnant. After bears mate in late spring and early summer, a female's eggs are fertilized but they do not implant in the uterus. By midsummer the fertilized egg has developed into a multicelled blastocyst (an early stage embryo), but further growth is arrested. The embryo floats freely in the uterus until denning time, later in the fall.

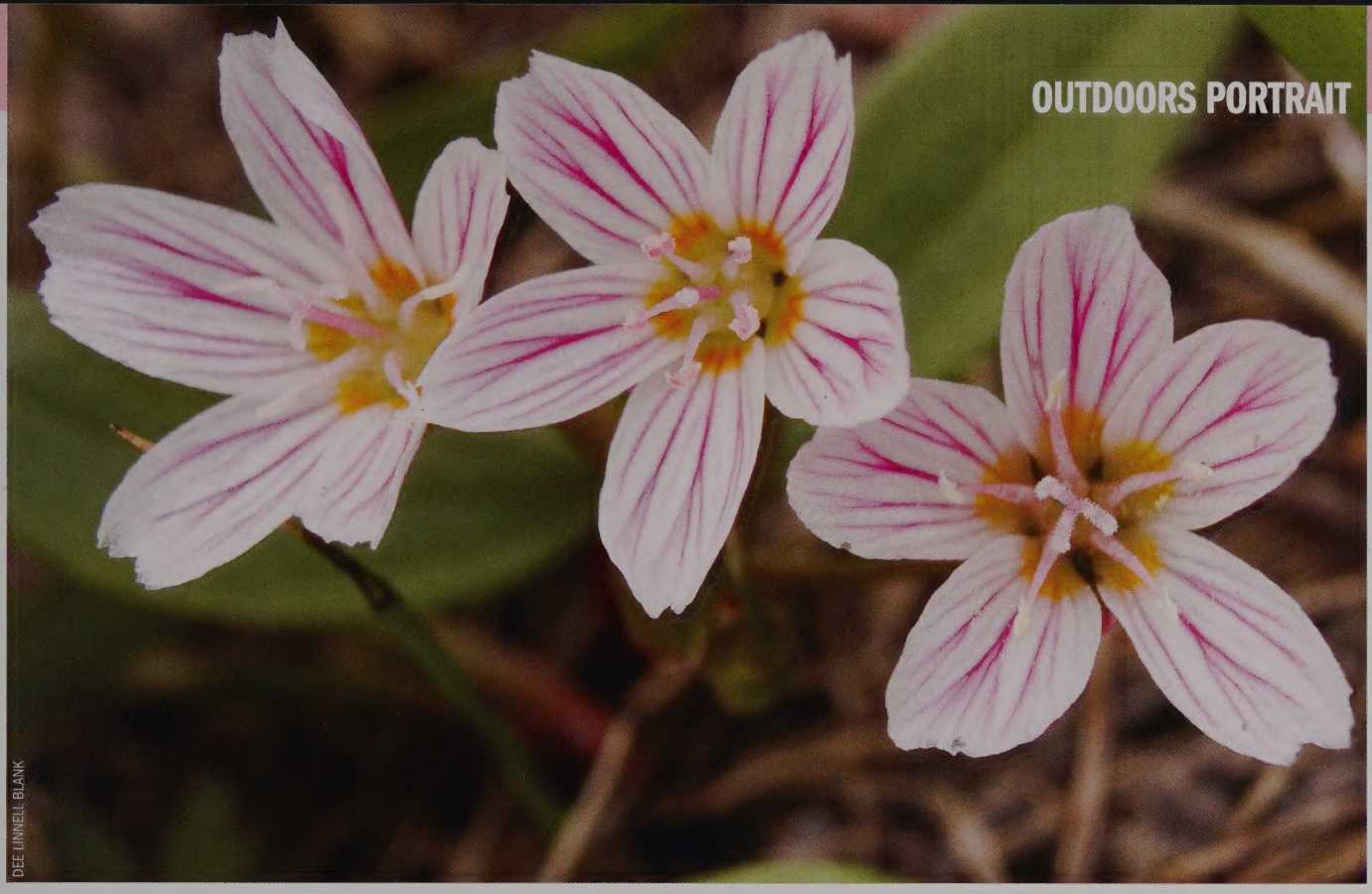
This delayed implantation allows the female bear's body to assess whether it has sufficient fat reserves to carry, give birth to, and nurse cubs through the sow's long winter nap.

If fat reserves are present, it's all systems go. But if a bear hasn't gained enough fat, the blastocyst won't attach to the uterine wall, ensuring that a female in poor condition will not be further stressed by reproduction. Then the bear's body absorbs the embryo, gaining a bit of nourishment.

Wow.

Sometimes when comparing humans to other animals, I find it hard to believe that we are the more advanced species.

Bruce Auchly manages the regional Information and Education Program in Great Falls.



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Spring Beauty

Claytonia lanceolata

By Robin Patten

While trekking across Montana's high country in late spring, I often come across subalpine meadows worked over by an animal with strong claws. Ragged furrows scar the ground, with clumps of dirt scattered wildly about. Tattered white petals and bits of bulb-like plant material are other clues that a grizzly bear was harvesting nutritious flowering plants called spring beauties.

Identification

Spring beauty is a common early spring wildflower. The small 2- to 6-inch-tall perennial herb is easy to overlook when just a few have emerged. But when large numbers begin blooming, they can turn an entire meadow white with blossoms. The spring beauty in bloom is fairly easy to identify: a roughly dime-sized flower of five white petals, notched at the tip and delicately marked with pink veins, and five conspicuous stamens. A pair of narrow, lance-shaped leaves sits just below the cluster of blossoms. Underground is the plant's "corm," a spherical portion of the stem about the size of a marble.

Robin Patten is a writer in Bozeman.

Range and flowering season

Spring beauty grows throughout the Rocky Mountain region from sagebrush foothills to alpine meadows, usually in open areas that have moist soils. The plant blooms shortly after snowmelt, which ranges from April to midsummer depending on elevation and latitude.

Wildlife value

The spring beauty's carbohydrate-rich corm is an important food for black and grizzly bears and burrowing rodents. Kevin Frey, FWP bear biologist in Bozeman, says spring beauty is part of the grizzly's spring diet along with Cous biscuitroot, cow parsnip, glacier lily, and licorice root. Using their long front claws and powerful shoulder muscles, grizzlies rototill fields of spring beauty to harvest the nutritious stem. Because harvesting such tiny food items can burn up more calories than it yields, Frey says grizzlies often raid underground chambers where pocket gophers and other rodents sometimes store hundreds of corms.

Scientific name

Claytonia comes from the 18th-century English naturalist John Clayton, while *lanceolata* refers to the plant's narrow, lance-shaped leaves.

Human use

Humans have long fed on the spring beauty's corm and vitamin C-rich leaves. Native Americans dug corms in spring after the plants flowered to supplement their diet. Because spring beauty corms are high in starch and digestible sugar, they can be eaten raw and are occasionally gathered by early season backpackers to supplement trail meals. The ones I've tried tasted something like a cross between a mellow radish and a raw potato. Dubbed "Indian potatoes" by early settlers, corms can also be baked, steamed, dried and ground into a flour for cakes, or stored overwinter.

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PARTING SHOT

FANCY DANCER A male sharp-tailed grouse displays on a mating lek near Hinsdale. See more marvelous bird courtship displays on page 28. Photo by Mona Doebler.

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